

# PATENT ABSTRACTS OF JAPAN

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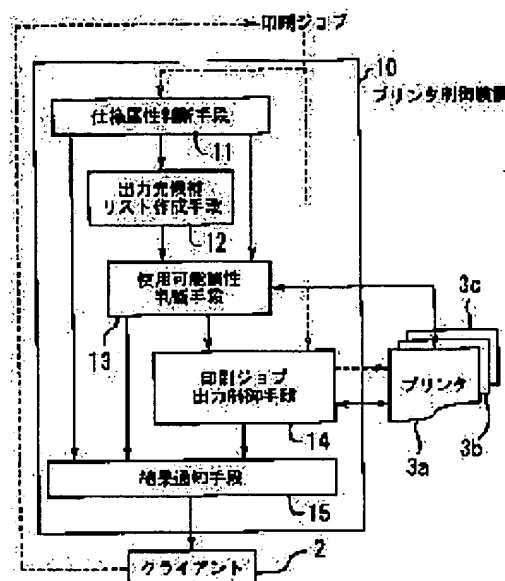
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## (54) PRINTER CONTROLLER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To select a printer according to the necessary attribute of a print job and restart the job halfway on another printer if the process is interrupted.

**SOLUTION:** This controller 10 searches for a printer which meets the necessary attribute of the print job by a specification attribute judging means 11. An output destination candidate list generating means 12 generates a list of searched printers as output destination candidates. A usable attribute judging means 13 selects a printer which is currently usable on the basis of the output destination candidate list. The selected printer is decided as an execution printer and the print job is sent from a print job control means 14. If trouble occurs during the execution, another output destination candidate is decided as a new execution printer on the basis of print elapse information stored in the print job control means 14 and the process is restarted. All information is reported to the client 2 through a result informing means 15.



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CLAIMS

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[Claim]

[Claim 1] The attribute which was suitable for the printing job as which the aforementioned printer was inputted from the client in the printer control unit which controls two or more printers A specification attribute decision means to judge whether it has as a specification attribute about the function in which specification up use of the aforementioned printer is possible, The aforementioned printer judged to be suitable for the aforementioned printing job is made into an output place candidate. An usable attribute decision means to judge whether an output place candidate list creation means to create an output place candidate list, and the usable attribute of the aforementioned output place candidate's present agree with the required attribute which the aforementioned printing job needs, A printing job output-control means to use as an execution printer the aforementioned printer judged to agree, and to output the aforementioned printing job to the aforementioned execution printer, It is the printer control unit characterized by having a notice means as a result of notifying the cause to the aforementioned client, when the information about the aforementioned execution printer or the aforementioned printing job is not able to be performed.

[Claim 2] A printer monitoring means for the aforementioned printing job output-control means to supervise the aforementioned execution printer, and to acquire a printing progress information, A printing progress information storage means to memorize the aforementioned printing progress information, and the failure detection means which detects the failure generated to the aforementioned execution printer, and emits a failure detection signal, The printer control unit of the claim 1 publication which receives the aforementioned failure detection signal, uses the output place candidate other than the aforementioned execution printer as a new execution printer, and is characterized by having a making [ a printing job / halfway resumption printing on the basis of the aforementioned printing progress information ] resumption means.

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DETAILED DESCRIPTION

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[Detailed description]

[0001]

[The technical field to which invention belongs] this invention relates to the printer control unit which controls two or more printers especially about a printer control unit.

[0002]

[Prior art] By development of network technique in recent years, the example which connects two or more printers to a network has increased. An user can print now using the arbitrary printers connected to the network, and the deployment of resources is progressing.

[0003] On the other hand, the example which failure generates also increases in the printer during printing. There is a thing of waiting until it interrupts a job like a publication-number 259342 [ six to ] official report and a printer restores as a conventional example which solves such failure.

[0004]

[Object of the Invention] However, in the above conventional examples, when the form of a size required for the specified printer was not set or the font was not prepared, even if processing stopped, the user had the trouble where the cause was not known.

[0005] Moreover, it will not complete but processing will interrupt the printing job transmitted during execution of a printing job when a certain trouble produced the paper jam, the form piece, etc. When the generated trouble cannot be solved, there is no technique besides performing the interrupted printing job again by another printer, and the futility that the printed matter currently outputted by the interruption is outputted again will arise.

[0006] It sets it as the 1st purpose to offer the print control unit which this invention is made in view of such a point, and assigns a printing job to a printer according to the required attribute.

[0007] Furthermore, when processing of a printer is interrupted, the 2nd purpose of this invention chooses another printer which can be substituted according to a required attribute, and is to offer the print control unit with the function to continue only processing which remained.

[0008]

[The means for solving a technical problem] In the printer control unit which controls two or more printers by this invention in order to solve the above-mentioned technical problem A specification attribute decision means to judge whether it has an attribute suitable for the printing job as which the aforementioned printer was inputted from the client as a specification attribute about the function in which specification up use of the aforementioned printer is possible, The aforementioned printer judged to be suitable for the aforementioned printing job is made into an output place candidate. An usable attribute decision means to judge whether an output place candidate list creation means to create an output place candidate list, and the usable attribute of the aforementioned output place candidate's present agree with the required attribute which the aforementioned printing job needs, A printing job output-control means to use as an execution printer the aforementioned printer judged to agree, and to output an object printing job to the aforementioned execution printer, The printer control unit characterized by having a notice means as a result of notifying the cause to the aforementioned client, when the information about the aforementioned execution printer or the aforementioned printing job is not able to be performed is offered.

[0009] Here, it judges whether the specification attribute decision means has a specification attribute about the printing function suitable for the printing job as which the printer was inputted from the client. An output place candidate list creation means makes the printer judged to be suitable for the printing job an output place candidate, and creates an output place candidate list. An usable attribute decision means judges whether the usable attribute of an output place candidate's present agrees with the required attribute which a printing job needs. A printing job output-control means uses as an execution printer the printer judged to agree, and outputs a printing job to an execution printer. The notice means of a result notifies the cause to a client, when the information about an execution printer or a printing job is not able to be performed.

[0010]

[Gestalt of implementation of invention] Hereafter, the gestalt of enforcement of this invention is explained based on a drawing. Drawing 1 is the principle view of the printer control unit of this invention. The printer control unit 10 is connected with the client 2 and two or more printers 3a, 3b, and 3c.

[0011] the printer control unit 10 -- the specification attribute decision means 11, the output place candidate list creation means 12, the usable attribute decision means 13, the printing job output-control means 14, and a result -- the notice means 15 -- since -- it is constituted

[0012] It judges whether the specification attribute decision means 11 has the specification attribute to which each physical printer which extracts the required attribute of a printing job and this printer control unit 10 is controlling fitted execution of this printing job.

[0013] The specification attribute said here is the product specification of a printer itself, and are things, such as good improper [ of \*\*\*\*\*s, such as a size of the form which can be set a modality of built-in font, PDL (Page Description Language), and a stapler stop, and double-sided printing ], and resolution. The printer judged to be suitable for execution is inputted into the output place candidate list creation means 12 as an output place candidate. Moreover, the

required attribute of the extracted printing job is inputted into the usable attribute decision means 13.

[0014] The output place candidate list creation means 12 creates an output place candidate list on the basis of the inputted output place candidate. The usable attribute decision means 13 judges whether with reference to an output place candidate list, the usable attribute of each output place candidate's present has agreed with the required attribute of the printing job inputted from the specification attribute decision means 11.

[0015] The present usable attributes said here are the size of the form tray with which the output place candidate is equipped at this time, the existence of a form, the existence of the supplement need for a stapler needle, etc. The identifier of the output place candidate judged to have agreed is inputted into the printing job output-control means 14.

[0016] From the identifier of the inputted physical printer, the printing job output-control means 14 chooses an execution printer, and transmits a printing job. The notice means 15 of a result notifies the purport to a client 2, when the printer which fitted the printing job in the specification attribute decision means 11 does not exist. Moreover, when the printer which has similarly the present usable attribute which agrees with the required attribute of a printing job in the usable attribute decision means 13 does not exist, the information about which attribute did not agree among the usable attributes of an output place candidate's present is notified. When printing is completed normally, it notifies to a client 2 where the execution printer outputted printed matter.

[0017] By using the printer control unit of such a configuration, a client can perform the printer suitable for the printing job required know [ the specification attribute of each printer, and the present usable attribute / continue ].

[0018] By using this printer control unit, two or more physical printers can be collectively treated as a logic printer. A logic printer is what carried out grouping of two or more physical printers, and it is virtually arranged on a network as a printer having the function of two or more printers. A client should just transmit a printing job to a logic printer like the case where it prints by the physical printer. Decision of the execution printer according to the status of each physical printer and sending of the printing job to the determined execution printer are anew performed from a printer control unit.

[0019] Next, the idea of a logic printer is explained. Drawing 2 is drawing showing the idea of a logic printer. The printer control units 10a and 10b, the physical printers 3a, 3b, 3c, 3d, and 3e, clients 2a and 2b and ..., and \*\* are connected to the network 4.

[0020] Here, printer control unit 10a carries out grouping of the physical printers 3a, 3b, 3c, and 3d, and printer control unit 10b carries out grouping of the physical printers 3d and 3e for logic printer A, and suppose that logic printer B is constituted, respectively.

[0021] As shown in drawing, physical printer 3a has the specification attribute of /Gothic 12p paper-size:A4 and next morning [ built-in font: ]. Physical printer 3b has the specification attribute of 12p paper-size:B4 and next morning [ built-in font: ]. Physical printer 3c has the specification attribute of 14p paper-size:A3/A4 and next morning [ built-in font: ]. Physical printer 3d, it has the specification attribute of 12p/14p paper-size:A4 and next morning [ built-in font: ]. Physical printer 3e has the specification attribute of 12p paper-size:A5/B5, and next morning [ built-in font: ].

[0022] Client 2a presupposes that you want to perform paper-size:A4 and the printing job which has the required attribute of 12p next morning [ used font: ]. If a printing job is transmitted to logic printer A, 3a and 3d with which a specification attribute agrees in the physical printers 3a, 3b, 3c, and 3d will become an output place candidate. Here, as for 3c, in 3b, the built-in font has not agreed [ the paper size ] with the required attribute of a printing job.

[0023] Physical printer 3a is first chosen as an execution printer, and during execution of a printing job, a form goes out on the way and presupposes that printing was interrupted. Although printer control unit 10a used physical printer 3a for client 2a as an execution printer, notice of having been interrupted by the form piece is performed. If the user who looked at the notice fills up a form, physical printer 3a will be resumed from the part which interrupted printing.

[0024] When there is no supplement of a form in physical printer 3a, printer control unit 10a chooses physical printer 3d as a new execution printer. Physical printer 3d to which designation and printing job of a printing resumption were transmitted from printer control unit 10a, printing is resumed only from the part which printing interrupted. If all printing processings are completed by physical printer 3d, printer control unit 10a will notify incidental informations, such as the output location of physical printers [ 3a and 3d ] printed matter, and a printing domain, to client 2a, and will end processing.

[0025] Thus, it is not necessary to pack the physical printer of several sets and to show a client as a logic printer, and an user becomes unnecessary to memorize the attribute of each physical printer by considering as the alternative at the time of printing job sending.

[0026] Still detailed explanation is given about the printer control unit of this invention here. Drawing 3 is the block diagram showing the whole printer control unit of this invention. A client 2, two or more physical printers 3a, 3b, and 3c, and \*\* are connected to the printer control unit 10. this printer control unit 10 -- the specification attribute decision means 11, the output place candidate list creation means 12, the usable attribute decision means 13, the printing job output-control means 14, and a result -- the notice means 15 -- since -- it is constituted

[0027] the specification attribute decision means 11 -- specification attribute storage means 11a, required attribute extraction means 11b, and specification decision means 11c -- since -- it is constituted The printing job output-control means 14 has 14d of printing resumption meanses with printer monitoring means 14a, failure detection means 14b, and printing progress information storage means 14c. In drawing, specification attribute storage means 11a has memorized all the specification attributes of the physical printer under a control of this printer control unit 10, and inputs this specification attribute into specification decision means 11c one after another. Required attribute extraction means 11b extracts the required attribute of the printing job transmitted from the client, and inputs the extracted required attribute into specification decision means 11c and the usable attribute decision means 13.

[0028] Specification decision means 11c judges whether it is suitable for execution of a printing job about each physical printer from two kinds of inputted attributes. It is inputted into the output place candidate list creation means 12, using as an output place candidate the physical printer judged to be suitable for execution.

[0029] The output place candidate list creation means 12 creates an output place candidate list on the basis of the output place candidate inputted from the aforementioned specification decision means 11c. The usable attribute decision means 13 judges whether the usable attribute of each output place candidate's present agrees with the required attribute of a printing job with reference to an output place candidate list. The identifier of the printer judged to agree is inputted into the printing job

output-control means 14.

[0030] The printing job output-control means 14 uses the physical printer with the inputted identifier as an execution printer, and transmits a printing job. Printer monitoring means 14a checks whether the printing job has been normally inputted into the execution printer. When it is able to be checked that it had been inputted normally, the output place candidate list creation means 12 is requested to remove this printer at the time of an output place candidate list creation of another printing job. Moreover, when it is able to be checked that it had been inputted normally, the execution status of a printing job is supervised for the page of fixed timing, every [ for example, ]. The result of monitoring is memorized by printing progress information storage means 14c as a printing progress information.

[0031] When execution of a printing job is completed normally, printer monitoring means 14a detects an end, and performs the notice which is good also as an output place candidate of another printing job for this printer to the output place candidate list creation means 12.

[0032] Moreover, the printing job output-control means 14 gives the information on the arrangement location of an end report of a printing job and the information about an execution printer, i.e., an execution printer, etc. to a client 2 through the notice means 15 of a result.

[0033] Failure detection means 14b is supervising the execution printer serially, when a certain failure occurs and a printing job is interrupted during execution of a printing job, detects the interruption and the content of failure, and emits a failure detection signal. The content of the detected interruption and failure is brought to a client 2 through the notice means 15 of a result. If the cause of failure is removed here, the interrupted printing job will be resumed from the interrupted part.

[0034] 14d of printing resumption means receives a failure detection signal, and they use as a new execution printer another physical printer by which the attribute has agreed. This is based on the identifier of the physical printer inputted from the aforementioned usable attribute decision means 13. On the basis of storage of the aforementioned printing progress information storage means 14c, the designation which makes printing resume, and a printing job are transmitted to a new execution printer from the part which interrupted the printing job.

[0035] When presence of the printer which fitted the printing job by specification decision means 11c is not able to be checked, or when presence of the printer by which the required attribute of a printing job and the present usable attribute agree with the usable attribute decision means 13 is not able to be checked and it is any, the information on the printer which agrees about which required attribute having not existed etc. is given to a client 2 through the notice means 15 of a result.

[0036] moreover, the case where a printing job is performed using the printer of several sets -- from which page up to which page ] -- a printer of what -- \*\* -- the information to say is given through the notice means 15 a result from the printing job control means 14

[0037] By considering as such a configuration, an user can perform to not knowing which physical printer fits the printing job. Moreover, since there is no duplication and a resumption of printing is made by another printer which can be substituted even if execution of a printing job is interrupted by a certain cause, a useless output is not produced.

[0038] Next, flowing of operation when the printer control unit of this invention receives sending of a printing job is explained. Drawing 4 is a flow chart which shows flowing at the time of performing a printing job using the printer control unit of this invention.

The required attribute of a printing job is extracted by [S1] required attribute extraction means 11b.

The existence of the physical printer which fitted the printing job by [S2] specification decision means 11c is judged, and an output place candidate list is created with the output place candidate list creation means 12.

[S3] output place candidate list judges whether it is empty. If a list is empty, if it is not empty, it will progress to step S5 to step S4.

When [S4] output place candidate list is empty, the printer which satisfies the requirement of an object printing job will not exist in the physical printer which receives a control of this printer control unit 10. Through the notice means 15 of a result, a printing job is transmitted to another logic printer at a client, the required attribute of a printing job is changed, or a grade is proposed, and processing is ended.

It judges [ whether with [S5] usable attribute decision means 13, the usable attribute of the present of the physical printer in an output place candidate list agrees for the required attribute of a printing job, and ]. The identifier of the physical printer which agreed is inputted into the printing job output-control means 14.

An execution printer is chosen with [S6] printing job output-control means 14.

If selection of [S7] execution printer has been performed and it has not chosen to step S10, it progresses to step S8.

I understand that the physical printer by which the present usable attribute does not agree exists, and it has it that an execution printer cannot be chosen although [S8] output place candidate list is not empty, although a specification attribute agrees. The printing job output-control means 14 gives the information about the attribute which has not agreed to a client, and it asks [ whether it is in charge of a dissolution of a cause, and ] for decision (\*\*\*\*\* [ filling up a form, if it cannot print with a form piece ] etc.). If it becomes, it will report [ which does not cancel a cause ] to a client how far the printing job is performed, and processing will be ended. If there is a notice that it is in charge of a dissolution of a cause from a client, it will progress to step S9.

It judges [ whether the dissolution of the cause of [S9] was made, and ]. If canceled, if not canceled, it will progress to step S10 again to step S8.

If [S10] printing job output-control means 14 is saved, it will transmit a printing job to an execution printer with reference to a printing progress information.

By [S11] printer monitoring means 14a, an execution printer checks having received the printing job normally, and inputs the notice of an occupancy of this execution printer into the output place candidate list creation means 12.

It judges whether the execution interruption was detected by [S12] failure detection means 14b. If detected, it will progress to step S6, and it directs to choose another execution printer. If not detected, it progresses to step S13.

An execution printer is supervised by [S13] printer monitoring means 14a, and a printing progress information is acquired.

The acquired printing progress information is memorized to printing progress information storage means 14c.

It judges whether normal termination was detected by [S14] printer monitoring means 14a. If detected, it means ending execution of an object printing job normally. The information on an execution printer is given to a client and it is shown

whether it should go to take printed matter to where. It shows, when [ all ] two or more execution printers exist. If normal termination is not notified, a printing job is still under execution. It progresses to step S12 again, and processing is continued.

[0039] Thus, it can know whether the need of a client of considering to which printer its printing job being transmitted will be lost, and it should just go by advancing processing to take printed matter to where.

[0040] Next, it explains still in detail about an output place candidate list creation of step S2. Drawing 5 is a flow chart which shows the procedure of an output place candidate list creation.

The total of the physical printer which receives a control of this printer control unit 10 as [S21] constant N is memorized. 1 is put into [S22] variable i.

[S23] It judges whether it has the specification attribute which was suitable for the object printing job about the i-th physical printer after this. With [ i ] N [ below ], it progresses to step S24 and processing is continued. When i is larger than N, since the physical printer which is not judging does not exist, it ends this flow chart.

[S24] It judges [ whether the specification attribute of the i-th physical printer, the required attribute of an object printing job, and \*\* are equal, and ]. If equal, if not equal, it will progress to step S25 to step S26.

[S25] The i-th physical printer is added to an output place candidate list as an output place candidate.

[S26] Since decision was completed about the i-th physical printer, processing is moved to decision of the following physical printer. 1 is added to variable i, and it is referred to as new i, and progresses to step S23.

[0041] Since an output place candidate list is created in such a procedure whenever a new printing job is received, it can ask for the physical printer which can correspond to an object printing job serially.

[0042] Moreover, an explanation is added about selection of the execution printer of step S6. Drawing 6 is a flow chart which shows the procedure of selection of an execution printer.

The number of the physical printer which is in an output place candidate list as [S31] constant K is memorized.

1 is put into [S32] variable j.

[S33] It judges whether \*\* agrees with the present usable attribute and the required attribute of an object printing job about the j-th physical printer after this. With [ j ] K [ below ], it progresses to step S34 and processing is continued. When j is larger than K, since the physical printer which can be used as an execution printer does not exist, it ends this flow chart.

[S34] It judges [ whether the usable attribute of the present of the j-th physical printer, the required attribute of an object printing job, and \*\* are equal, and ]. If equal, if not equal, it will progress to step S35 to step S36.

[S35] Since it became clear that the usable attribute of the present of the j-th physical printer is equal to the required attribute of an object printing job, the j-th physical printer is chosen as an execution printer. This flow chart is ended.

[S36] Since it became clear that the usable attribute of the present of the j-th physical printer does not agree with the required attribute of an object printing job, suppose that the following physical printer is judged. 1 is added to variable j, and it is referred to as new j, and progresses to step S33.

[0043] It can judge whether by choosing an execution printer, the present usable attribute agrees for the required attribute of a printing job to all of the physical printers in an output place candidate list in such a procedure.

[0044]

[Effect of the invention] As explained above, in this invention, according to the attribute of a printing job, the suitable output place was determined and was considered as the configuration which can be performed. Thereby, an user can use the optimum printer, without knowing the attribute of each printer.

[0045] Moreover, even if the printer in printing job processing interrupts execution for a certain cause, processing which remained in another printer can be continued, without troubling an user's hand.

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TECHNICAL FIELD

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

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[Object of the Invention] However, in the above conventional examples, when the form of a size required for the specified printer was not set or the font was not prepared, even if processing stopped, the user had the trouble where the cause was not known.

[0005] Moreover, it will not complete but processing will interrupt the printing job transmitted during execution of a printing job when a certain trouble produced the paper jam, the form piece, etc. When the generated trouble cannot be solved, there is no technique besides performing the interrupted printing job again by another printer, and the futility that the printed matter currently outputted by the interruption is outputted again will arise.

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MEANS

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[0014] The output place candidate list creation means 12 creates an output place candidate list on the basis of the inputted output place candidate. The usable attribute decision means 13 judges whether with reference to an output place candidate list, the usable attribute of each output place candidate's present has agreed with the required attribute of the printing job inputted from the specification attribute decision means 11.

[0015] The present usable attributes said here are the size of the form tray with which the output place candidate is equipped at this time, the existence of a form, the existence of the supplement need for a stapler needle, etc. The identifier of the output place candidate judged to have agreed is inputted into the printing job output-control means 14.

[0016] From the identifier of the inputted physical printer, the printing job output-control means 14 chooses an execution printer, and transmits a printing job. The notice means 15 of a result notifies the purport to a client 2, when the printer which fitted the printing job in the specification attribute decision means 11 does not exist. Moreover, when the printer which has similarly the present usable attribute which agrees with the required attribute of a printing job in the usable attribute decision means 13 does not exist, the information about which attribute did not agree among the usable attributes of an output place candidate's present is notified. When printing is completed normally, it notifies to a client 2 where the execution printer outputted printed matter.

[0017] By using the printer control unit of such a configuration, a client can perform the printer suitable for the printing job required know [ the specification attribute of each printer, and the present usable attribute / continue ].

[0018] By using this printer control unit, two or more physical printers can be collectively treated as a logic printer. A logic printer is what carried out grouping of two or more physical printers, and it is virtually arranged on a network as a printer having the function of two or more printers. A client should just transmit a printing job to a logic printer like the case where it prints by the physical printer. Decision of the execution printer according to the status of each physical printer and sending of the printing job to the determined execution printer are anew performed from a printer control unit.

[0019] Next, the idea of a logic printer is explained. Drawing 2 is drawing showing the idea of a logic printer. The printer control units 10a and 10b, the physical printers 3a, 3b, 3c, 3d, and 3e, clients 2a and 2b and ..., and \*\* are connected to the network 4.

[0020] Here, printer control unit 10a carries out grouping of the physical printers 3a, 3b, 3c, and 3d, and printer control unit 10b carries out grouping of the physical printers 3d and 3e for logic printer A, and suppose that logic printer B is constituted, respectively.

[0021] As shown in drawing, physical printer 3a has the specification attribute of /Gothic 12p paper-size:A4 and next morning [ built-in font:]. Physical printer 3b has the specification attribute of 12p paper-size:B4 and next morning [ built-in font:]. Physical printer 3c has the specification attribute of 14p paper-size:A3/A4 and next morning [ built-in font:]. Physical printer 3d, it has the specification attribute of 12p/14p paper-size:A4 and next morning [ built-in font:]. Physical printer 3e has the specification attribute of 12p paper-size:A5/B5, and next morning [ built-in font:].

[0022] Client 2a presupposes that you want to perform paper-size:A4 and the printing job which has the required attribute of 12p next morning [ used font:]. If a printing job is transmitted to logic printer A, 3a and 3d with which a specification attribute agrees in the physical printers 3a, 3b, 3c, and 3d will become an output place candidate. Here, as for 3c, in 3b, the built-in font has not agreed [ the paper size ] with the required attribute of a printing job.

[0023] Physical printer 3a is first chosen as an execution printer, and during execution of a printing job, a form goes out on the way and presupposes that printing was interrupted. Although printer control unit 10a used physical printer 3a for client 2a as an execution printer, notice of having been interrupted by the form piece is performed. If the user who looked at the notice fills up a form, physical printer 3a will be resumed from the part which interrupted printing.

[0024] When there is no supplement of a form in physical printer 3a, printer control unit 10a chooses physical printer 3d as a new execution printer. Physical printer 3d to which designation and printing job of a printing resumption were transmitted from printer control unit 10a, printing is resumed only from the part which printing interrupted. If all printing processings are completed by physical printer 3d, printer control unit 10a will notify incidental informations, such as the output location of physical printers [ 3a and 3d ] printed matter, and a printing domain, to client 2a, and will end processing.

[0025] Thus, it is not necessary to pack the physical printer of several sets and to show a client as a logic printer, and an user becomes unnecessary to memorize the attribute of each physical printer by considering as the alternative at the time of printing job sending.

[0026] Still detailed explanation is given about the printer control unit of this invention here. Drawing 3 is the block diagram showing the whole printer control unit of this invention. A client 2, two or more physical printers 3a, 3b, and 3c, and \*\* are connected to the printer control unit 10. this printer control unit 10 -- the specification attribute decision means 11, the output place candidate list creation means 12, the usable attribute decision means 13, the printing job output-control means 14, and a result -- the notice means 15 -- since -- it is constituted

[0027] the specification attribute decision means 11 -- specification attribute storage means 11a, required attribute extraction means 11b, and specification decision means 11c -- since -- it is constituted The printing job output-control means 14 has 14d of printing resumption meanses with printer monitoring means 14a, failure detection means 14b, and printing progress information storage means 14c. In drawing, specification attribute storage means 11a has memorized all the specification attributes of the physical printer under a control of this printer control unit 10, and inputs this specification attribute into specification decision means 11c one after another. Required attribute extraction means 11b extracts the required attribute of the printing job transmitted from the client, and inputs the extracted required attribute into specification decision means 11c and the usable attribute decision means 13.

[0028] Specification decision means 11c judges whether it is suitable for execution of a printing job about each physical printer from two kinds of inputted attributes. It is inputted into the output place candidate list creation means 12, using as an output place candidate the physical printer judged to be suitable for execution.

[0029] The output place candidate list creation means 12 creates an output place candidate list on the basis of the output place candidate inputted from the aforementioned specification decision means 11c. The usable attribute decision means 13 judges whether the usable attribute of each output place candidate's present agrees with the required attribute of a printing job with reference to an output place candidate list. The identifier of the printer judged to agree is inputted into the printing job output-control means 14.

[0030] The printing job output-control means 14 uses the physical printer with the inputted identifier as an execution printer, and transmits a printing job. Printer monitoring means 14a checks whether the printing job has been normally inputted into the execution printer. When it is able to be checked that it had been inputted normally, the output place candidate list creation means 12 is requested to remove this printer at the time of an output place candidate list creation of another printing job. Moreover, when it is able to be checked that it had been inputted normally, the execution status of a printing job is supervised for the page of fixed timing, every [ for example, ]. The result of monitoring is memorized by printing progress information storage means 14c as a printing progress information.

[0031] When execution of a printing job is completed normally, printer monitoring means 14a detects an end, and performs the notice which is good also as an output place candidate of another printing job for this printer to the output place candidate list creation means 12.

[0032] Moreover, the printing job output-control means 14 gives the information on the arrangement location of an end report of a printing job and the information about an execution printer, i.e., an execution printer, etc. to a client 2 through the notice means 15 of a result.

[0033] Failure detection means 14b is supervising the execution printer serially, when a certain failure occurs and a printing job is interrupted during execution of a printing job, detects the interruption and the content of failure, and emits a failure detection signal. The content of the detected interruption and failure is brought to a client 2 through the notice means 15 of a result. If the cause of failure is removed here, the interrupted printing job will be resumed from the interrupted part.

[0034] 14d of printing resumption meanses receives a failure detection signal, and they use as a new execution printer another physical printer by which the attribute has agreed. This is based on the identifier of the physical printer inputted from the aforementioned usable attribute decision means 13. On the basis of storage of the aforementioned printing progress information storage means 14c, the designation which makes printing resume, and a printing job are transmitted to a new execution printer from the part which interrupted the printing job.

[0035] When presence of the printer which fitted the printing job by specification decision means 11c is not able to be checked, or when presence of the printer by which the required attribute of a printing job and the present usable attribute

agree with the usable attribute decision means 13 is not able to be checked and it is any, the information on the printer which agrees about which required attribute having not existed etc. is given to a client 2 through the notice means 15 of a result. [0036] moreover, the case where a printing job is performed using the printer of several sets -- from which page up to which page ] -- a printer of what -- \*\* -- the information to say is given through the notice means 15 a result from the printing job control means 14

[0037] By considering as such a configuration, an user can perform to not knowing which physical printer fits the printing job. Moreover, since there is no duplication and a resumption of printing is made by another printer which can be substituted even if execution of a printing job is interrupted by a certain cause, a useless output is not produced.

[0038] Next, flowing of operation when the printer control unit of this invention receives sending of a printing job is explained. Drawing 4 is a flow chart which shows flowing at the time of performing a printing job using the printer control unit of this invention.

The required attribute of a printing job is extracted by [S1] required attribute extraction means 11b.

The existence of the physical printer which fitted the printing job by [S2] specification decision means 11c is judged, and an output place candidate list is created with the output place candidate list creation means 12.

[S3] output place candidate list judges whether it is empty. If a list is empty, if it is not empty, it will progress to step S5 to step S4.

When [S4] output place candidate list is empty, the printer which satisfies the requirement of an object printing job will not exist in the physical printer which receives a control of this printer control unit 10. Through the notice means 15 of a result, a printing job is transmitted to another logic printer at a client, the required attribute of a printing job is changed, or a grade is proposed, and processing is ended.

It judges [ whether with [S5] usable attribute decision means 13, the usable attribute of the present of the physical printer in an output place candidate list agrees for the required attribute of a printing job, and ]. The identifier of the physical printer which agreed is inputted into the printing job output-control means 14.

An execution printer is chosen with [S6] printing job output-control means 14.

If selection of [S7] execution printer has been performed and it has not chosen to step S10, it progresses to step S8.

I understand that the physical printer by which the present usable attribute does not agree exists, and it has it that an execution printer cannot be chosen although [S8] output place candidate list is not empty, although a specification attribute agrees. The printing job output-control means 14 gives the information about the attribute which has not agreed to a client, and it asks [ whether it is in charge of a dissolution of a cause, and ] for decision (\*\*\*\*\* [ filling up a form, if it cannot print with a form piece ] etc.). If it becomes, it will report [ which does not cancel a cause ] to a client how far the printing job is performed, and processing will be ended. If there is a notice that it is in charge of a dissolution of a cause from a client, it will progress to step S9.

It judges [ whether the dissolution of the cause of [S9] was made, and ]. If canceled, if not canceled, it will progress to step S10 again to step S8.

If [S10] printing job output-control means 14 is saved, it will transmit a printing job to an execution printer with reference to a printing progress information.

By [S11] printer monitoring means 14a, an execution printer checks having received the printing job normally, and inputs the notice of an occupancy of this execution printer into the output place candidate list creation means 12.

It judges whether the execution interruption was detected by [S12] failure detection means 14b. If detected, it will progress to step S6, and it directs to choose another execution printer. If not detected, it progresses to step S13.

An execution printer is supervised by [S13] printer monitoring means 14a, and a printing progress information is acquired.

The acquired printing progress information is memorized to printing progress information storage means 14c.

It judges whether normal termination was detected by [S14] printer monitoring means 14a. If detected, it means ending execution of an object printing job normally. The information on an execution printer is given to a client and it is shown whether it should go to take printed matter to where. It shows, when [ all ] two or more execution printers exist. If normal termination is not notified, a printing job is still under execution. It progresses to step S12 again, and processing is continued.

[0039] Thus, it can know whether the need of a client of considering to which printer its printing job being transmitted will be lost, and it should just go by advancing processing to take printed matter to where.

[0040] Next, it explains still in detail about an output place candidate list creation of step S2. Drawing 5 is a flow chart which shows the procedure of an output place candidate list creation.

The total of the physical printer which receives a control of this printer control unit 10 as [S21] constant N is memorized.

1 is put into [S22] variable i.

[S23] It judges whether it has the specification attribute which was suitable for the object printing job about the i-th physical printer after this. With [ i ] N [ below ], it progresses to step S24 and processing is continued. When i is larger than N, since the physical printer which is not judging does not exist, it ends this flow chart.

[S24] It judges [ whether the specification attribute of the i-th physical printer, the required attribute of an object printing job, and \*\* are equal, and ]. If equal, if not equal, it will progress to step S25 to step S26.

[S25] The i-th physical printer is added to an output place candidate list as an output place candidate.

[S26] Since decision was completed about the i-th physical printer, processing is moved to decision of the following physical printer. 1 is added to variable i, and it is referred to as new i, and progresses to step S23.

[0041] Since an output place candidate list is created in such a procedure whenever a new printing job is received, it can ask for the physical printer which can correspond to an object printing job serially.

[0042] Moreover, an explanation is added about selection of the execution printer of step S6. Drawing 6 is a flow chart which shows the procedure of selection of an execution printer.

The number of the physical printer which is in an output place candidate list as [S31] constant K is memorized.

1 is put into [S32] variable j.

[S33] It judges whether \*\* agrees with the present usable attribute and the required attribute of an object printing job about the j-th physical printer after this. With [ j ] K [ below ], it progresses to step S34 and processing is continued. When j is

larger than K, since the physical printer which can be used as an execution printer does not exist, it ends this flow chart.

[S34] It judges [ whether the usable attribute of the present of the j-th physical printer, the required attribute of an object printing job, and \*\* are equal, and ]. If equal, if not equal, it will progress to step S35 to step S36.

[S35] Since it became clear that the usable attribute of the present of the j-th physical printer is equal to the required attribute of an object printing job, the j-th physical printer is chosen as an execution printer. This flow chart is ended.

[S36] Since it became clear that the usable attribute of the present of the j-th physical printer does not agree with the required attribute of an object printing job, suppose that the following physical printer is judged. 1 is added to variable j, and it is referred to as new j, and progresses to step S33.

[0043] It can judge whether by choosing an execution printer, the present usable attribute agrees for the required attribute of a printing job to all of the physical printers in an output place candidate list in such a procedure.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[An easy explanation of a drawing]

[ Drawing 1 ] It is the principle view of the printer control unit of this invention.

[ Drawing 2 ] It is the conceptual diagram of a logic printer.

[ Drawing 3 ] It is the block diagram showing the whole printer control unit of this invention.

[ Drawing 4 ] It is the flow chart which shows flowing at the time of performing a printing job using the printer control unit of this invention.

[ Drawing 5 ] It is the flow chart which shows the procedure of an output place candidate list creation.

[ Drawing 6 ] It is the flow chart which shows the procedure of selection of an execution printer.

[An explanation of a sign]

2 Client

3a, 3b, 3c Printer

10 Printer Control Unit

11 Specification Attribute Decision Means

12 Output Place Candidate List Creation Means

13 Usable Attribute Decision Means

14 Printing Job Output-Control Means

15 Notice Means of Result

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[Translation done.]

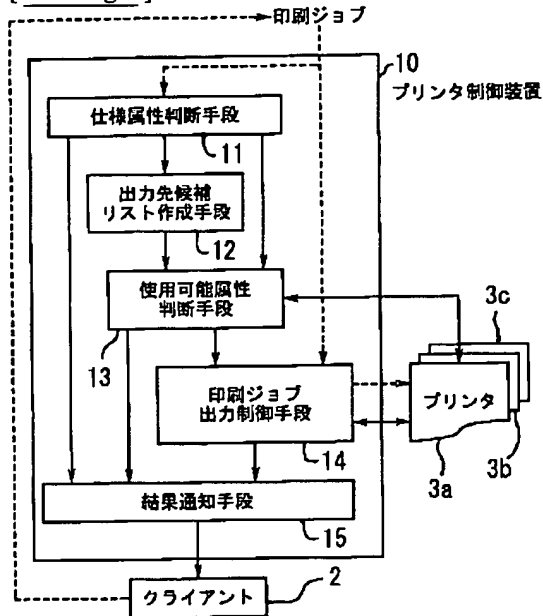
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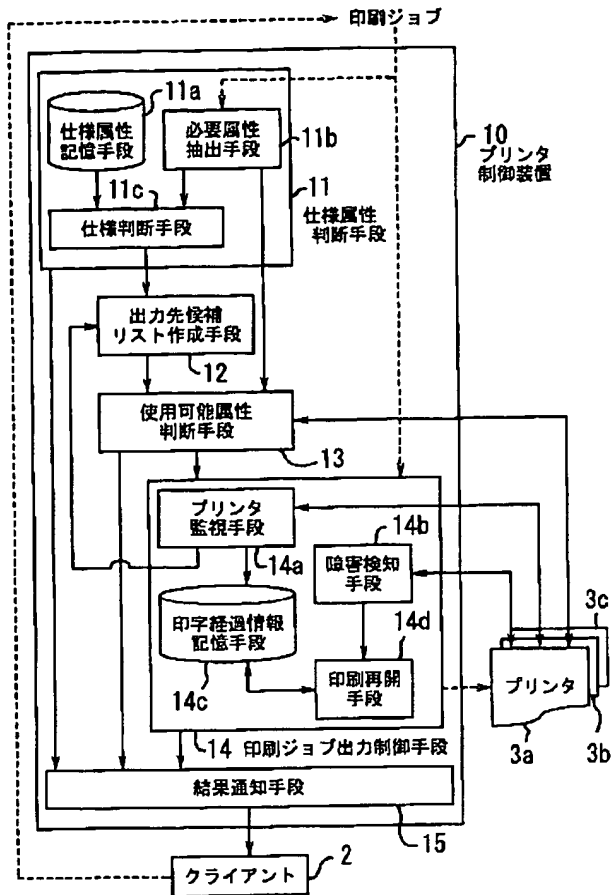
DRAWINGS

[ Drawing 1 ]

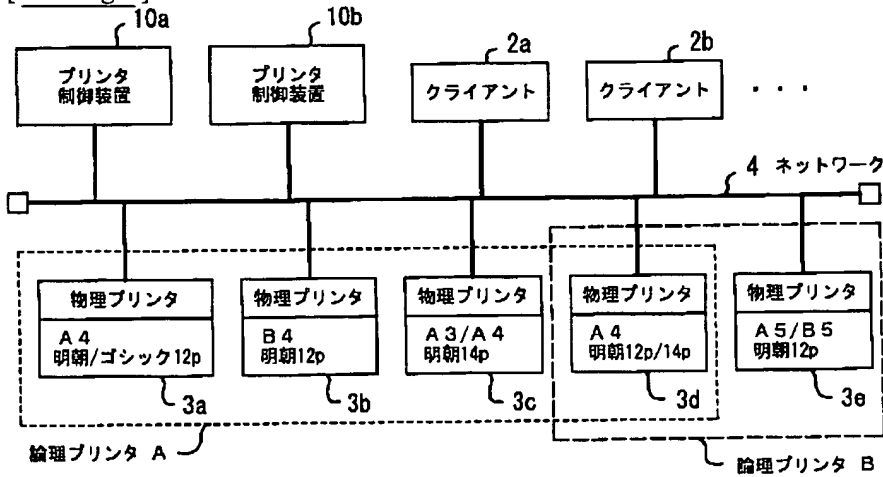


[ Drawing 3 ]

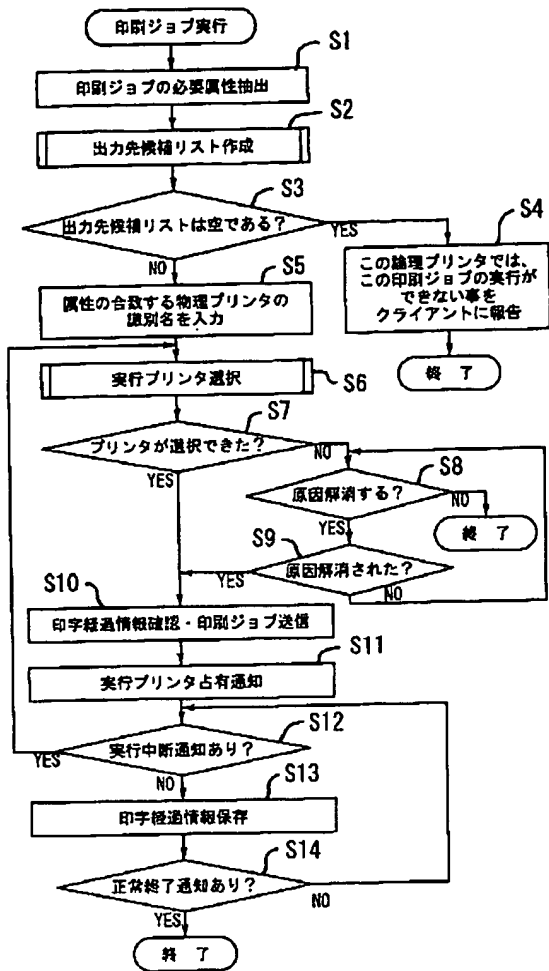




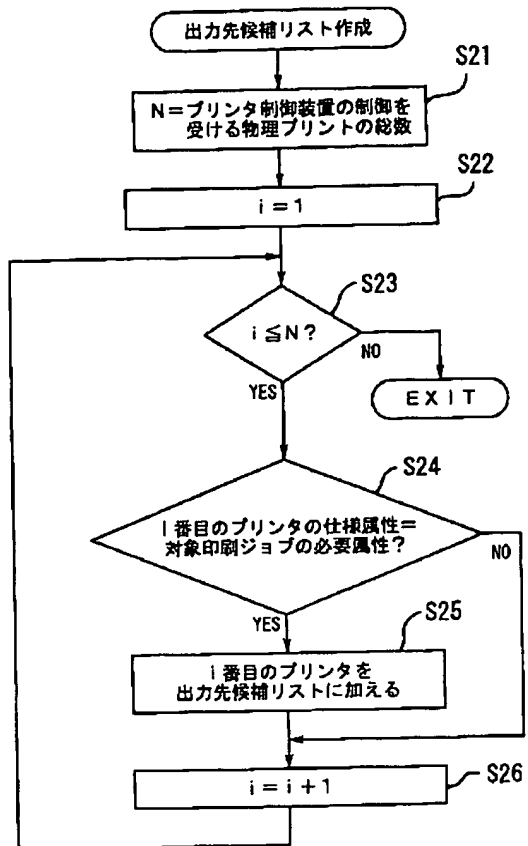
[ Drawing 2 ]



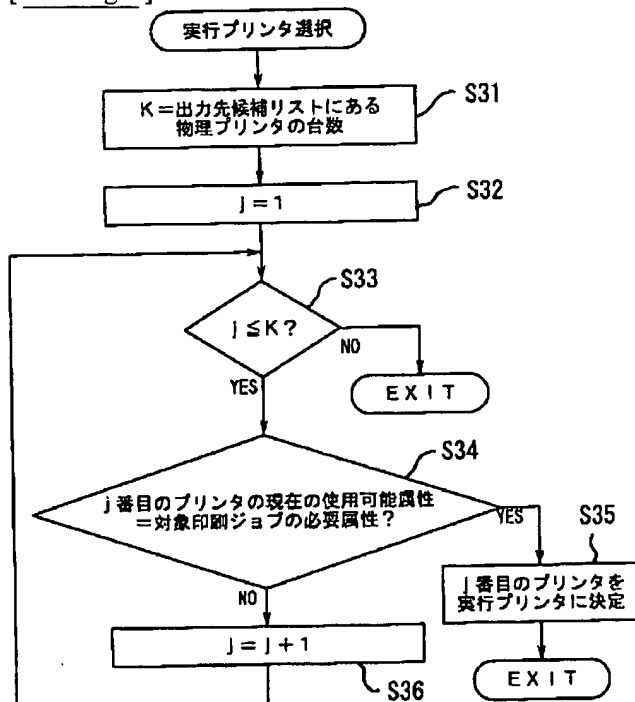
[ Drawing 4 ]



[ Drawing 5 ]



[ Drawing 6 ]



[Translation done.]